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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,958	12/04/2003	Shogo Kiyota	5332-8PCON	7410

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EXAMINER	
DAHIMENE, MAHMOUD	
ART UNIT	**PAPER NUMBER**
1765	
MAIL DATE	**DELIVERY MODE**
09/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/727,958	KIYOTA ET AL.	
	Examiner	Art Unit	
	Mahmoud Dahimene	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2007*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3 and 4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3 and 4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US 6,787,989) in view of Nakaya et al (US 6,188,176) and Kurachi et al. (US 6,440,531).

Regarding claims 1, 3 and 4, the reference Wada describes a substrate with a transparent condcutive film is provided, which has a high work function and an excellent surface smoothness as well as a reduced specific resistance to thereby ensure a reduced power consumption and enhanced display quality. An ITO film 2 is formed on

a glass substrate 1 by an ion plating method by using an ITO sintered compact with an SnO.sub.2 content of 4 to 6 wt %. The ITO film 2 obtained as above has a surface roughness range of 1 to 10 nm which overlaps applicant's claimed range of 0 to 8 nm. Overlapping ranges are held obvious.

It is noted that Wada is silent about the smoothness (roughness) of the substrate.

Nakaya discloses an organic EL preparation method wherein "On a substrate of Corning (7059) glass, an ITO transparent electrode (hole injecting electrode) was deposited by sputtering as in Experiment 1, which electrode was the same as Sample No. 1. The glass substrate had a surface roughness: Ra≤0.68 nm and Rmax≤.2.0nm (column 13, line 46) which is included in the applicant claim range of 0 to 4 nm. Overlapping ranges are held obvious.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process Wada by controlling the surface roughness of the substrate because Wada teaches lower roughness is desirable and substrate smoothness helps achieving a desired smoothness on deposited layers. One of ordinary skill in the art would have been motivated to choose a high substrate surface smoothness of 0 to 4 nm in order to obtain a deposited layer with high smoothness.

It is noted that both references of Wada and Nakaya are silent about "controlling the surface smoothness is carried out by omitting polishing of the surface of the transparent substrate" as described in applicant's claim 1.

The examiner notes that Nakaya discloses "In one preferred embodiment of the invention, the substrate has a surface roughness below a specific value. By restricting

the surface roughness of the substrate below the specific value, the occurrence of current leakage and the generation and propagation of non-luminous regions known as dark spots are suppressed." (column 3, line 51). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the process of Wada by seeking a substrate surface roughness as low as possible because the market demand for higher performance devices in a smaller space will dictates even lower current leakage and lower generation and propagation of non-luminous regions known as dark spots. As device dimensions shrink, the few dark spots acceptable in one device generation becomes unacceptable for the next device generation when the dark spot becomes comparable to the device size.

Kurachi discloses a hydrofluoric acid etched substrate, The glass substrate has a recording surface having an average surface roughness Ra smaller than 0.3 nm. (abstract). Kurachi discloses "It has been found according to the present invention that in order to keep the surface smoothness (average surface roughness) Ra of the substrate in the range of Ra<0.3 nm when cleaned by the **alkali** after having been treated with the acid, the etching rate of the substrate glass with an aqueous solution of 0.1 weight % of hydrofluoric acid at a temperature of 50.degree. C., as an indication of acid resistance, needs to be 45 nm/min. or less." (column 2, line 45), and "A polishing compound mainly composed of cerium oxide, which is used most generally, can be removed most efficiently when it is dissolved in an aqueous solution of sulfuric acid. If the concentration of the sulfuric acid used to remove the polishing compound were less than 0.01 weight %, then the removing ability would be insufficient, and if the

concentration of the sulfuric acid exceeded 5 weight %, then fine defects of the glass substrate would appear on the surface. Therefore, the concentration of the sulfuric acid should preferably in the range from 0.01 to 5 weight %. In order to keep a desired level of surface smoothness under this condition, the etching rate of the substrate glass with an aqueous solution of 0.1 weight % of hydrofluoric acid at a temperature of 50.degree. C. should preferably be 45 nm/min. or less." (column 2, line 61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the process of Wada as modified by Nakaya by employing the non-polishing method of Kurachi because Kurachi discloses the etching method, as described above is conventionally used in order to keep the surface smoothness (average surface roughness) Ra of the substrate in the range of Ra<0.3 nm. One of ordinary skill in the art would have been motivated to further modify Wada with the method of Kurachi in order to obtain an even smoother surface because a smoother surface is desirable as suggested by Nakaya (and discussed above). It would have been obvious to one of ordinary skill in the art at the time the invention was made to omit polishing all together if the original substrate is provided with a smoothness already in the range described by Nakaya, in such case polishing is not necessary. If the etching step is required, the control of the substrate surface final smoothness of Kurachi is carried out by an etching solution not a polishing step.

Response to Arguments

Applicant's arguments, see 4-7, filed 7/9/2007, with respect to the rejection(s) of claim(s) 1,3,4, under 35 USC § 103 have been fully considered and are persuasive in view of the new amendments and the fact that Nakaya suggests controlling the surface smoothness by polishing the substrate surface as pointed out by the applicant. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kurachi et al. (US 6,440,531).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahmoud Dahimene whose telephone number is (571) 272-2410. The examiner can normally be reached on week days from 8:00 AM. to 5:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MD.

DUY-VU N. DEO
PRIMARY EXAMINER